CENTRAL EXPERIMENTAL FARM,

DEPARTMENT OF AGRICULTURE,

OTTAWA, - - - - CANADA.

BULLETIN No. 2.

DECEMBER 15th, 1887.

To the Honourable the Minister of Agriculture:

Sir,

I have the honour to submit herewith, for your approval, the second bulletin of the Central Experimental Farm, in which will be found some details of the more important features of the work which has been undertaken in agriculture, horticulture and forestry since the issue of bulletin No. 1. Owing to a lengthened absence in the Maritime Provinces and in the North-West and British Columbia, the issue of this bulletin has been unavoidably delayed. Hoping that the marked progress made at the Central Experimental Farm will be so far satisfactory to you as to gain your approbation,

I have the honour to be,

Your obedient servant,

WM. SAUNDERS,

Director.

Ottawa, December 15th, 1887.

CENTRAL EXPERIMENTAL FARM,

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DEPARTMENT OF AGRICULTURE,
OTTAWA, CANADA.

TESTING THE VITALITY OF SEEDS.

In the first bulletin issued from the Central Experimental Farm in February last, an invitation was extended to farmers, gardeners, horticulturists and others, interested in the quality and purity of agricultural seeds to send samples to the farm to be tested as to their vitality and germinating power. In response to this request 187 packages of seeds were received during the months of March and April, coming from many different sections of the Dominion, but the larger proportion of them from Ontario and Manitoba.

These seeds were found to vary as to their vitality, some being nearly perfect in this respect, while others were worthless from the loss of all their germinating power. The specimens of grain sent from Manitoba and the North-West Territories showed a higher average of vitality than those from the Eastern Provinces of the Dominion, an indication of the correctness of the opinion generally held, that grain grown in Northern countries possesses more vigour and vitality than that produced in more Southern latitudes, which makes it more valuable for seed. Comparing Manitoba and the North-West Territories with Ontario and the Provinces east, the few tests thus far made show the following averages :—

	North-West Provinces. Proportion of Vitality.	Eastern Provinces. Proportion of Vitality.
Wheat.....	96 per cent.	92
Barley.....	97 "	73
Oats.....	95 "	65

It is proposed to undertake a much larger number of tests during the coming season, and in subsequent years, for the purpose of ascertaining whether these differences are normal and within what limits they vary.

The following table has been prepared to show the number of tests made of each sort, the highest and lowest degrees of vitality, as well as the average in each case:—

	No. of tests	Highest vitality.	Lowest vitality.	Average vitality.
Wheat	37	99	36	88
Barley	17	99	34	91
Oats	14	99	52	85
Corn	14	100	22	86
Peas	4	94	38	78
Timothy	4	97	89	94
Other Grass Seeds	12	89	00	42
Clover	6	95	70	83
Turnip	9	97	58	81
Mangold	11	97	39	74
Carrot	11	78	12	50
Cabbage	8	93	16	64
Beet	5	98	63	79
Tomato	5	72	44	61
Onion	5	80	28	59
Flax Seed	3	95	81	86
Parsnip	3	50	24	33
Radish	2	40	19	29½
Miscellaneous Seeds	17			
	187			

The miscellaneous seeds included one sample each of Rye, vitality 90 per cent.; Rape seed, 98; Buckwheat, 80; Beans, 68; Celery, 10; Cauliflower, 48; Cucumber, 36; Lettuce, 65; Cress, 15; Sage, 23; Spinach, 8; Summer Savory, 10; Sweet Marjoram, 17, and Maple tree seed from British Columbia (*Acer macrophyllum*) 40 per cent. Also two samples of Melon seed and one of Squash, both of which entirely failed; these were said to be ten years old, and were supposed by the party sending them to be gaining in vitality by being kept.

Some very useful and practical results were reached by these tests, of which the following will serve as examples:—

A dealer in agricultural seeds, for whom some tests were made, writes thus: "Thanks for your careful report on seeds sent for testing; it will ensure the destruction of all of low average growth and thus directly benefit the people for whom the Experimental Farm was established."

A handsome sample of Cream Egyptian Oats, held for seed, was sent from Nova Scotia. These oats were plump and heavy, weighed about forty pounds to the bushel, and appeared to be in good condition. On being tested they showed a germinating power of only forty-seven per cent; the blades were weak and sickly, showing that the oats were quite unfit for seed. These had probably been injured in the mow by being taken in before they were thoroughly cured.

A sample was received from a lot of 125 bushels of garden peas grown for seed, which it was suspected had been injured in harvesting, on testing them they were found to have lost much of their vitality, only thirty-eight per cent sprouted.

There exists in the minds of some farmers a prejudice against the use of corn for seed, which has been stacked out all winter, many asserting that it will not grow. A sample sent by a correspondent to test this point showed a vitality of eighty-five per cent., which was about the average quality of the samples received.

Last season the house for seed testing was not completed until February, which made the time for work very short, and many did not hear of the advantages offered until it was too late to avail themselves of them. Seed testing for next season's sowing has already begun and will be continued throughout the winter. It is hoped that many will avail themselves of this opportunity and send their samples early. No charge is made for testing and samples addressed to the Central Experimental Farm, Department of Agriculture, Ottawa, pass free through the mail. The time occupied by each test is from ten to twenty days; the quantity of seed required will vary with the size of the individual grains, not less than 250 to 300 seeds should be sent.

IMPORTATION OF SEED GRAIN.

Early in the winter of 1886, correspondence was opened with reliable dealers in seed grain in England, Germany, France and

Northern Russia, with the view of securing a large number of varieties for comparative test. Wheat was sought from Northern Russia with the hope of obtaining a hard wheat of good quality, equal if possible to the Red Fife, so much esteemed, with an earlier ripening habit, so as to lessen the loss which early frost sometimes entails on the vast wheat crops of Manitoba and the North-West Territories. A large number of varieties of wheat, oats and barley, were obtained in Germany, England and France, gathered from all quarters of the world, for testing on the Experimental Farm at Ottawa, and one consignment of wheat from Riga, Russia, intended principally for distribution among the farmers in the more northern sections of the Dominion.

This wheat as received was of excellent quality, plump and hard, weighing sixty-one pounds to the bushel, and, when submitted to experts, was said to grade "No. 1, hard." There were distributed through the mail 667 sample bags of this grain, each weighing about three pounds; 277 of these were sent to Manitoba and the North-West Territories, and the remainder to the other Provinces, so that the value and period of ripening of this wheat might be ascertained under many varying conditions. Among the farmers in the Eastern Provinces some Manitoba seed-wheat of excellent quality was similarly distributed, which increased the number of samples sent out for trial to 1,149. Besides this there were sent to the Commissioner of Indian Affairs, Lieut.-Gov. Dewdney, about 1,200 pounds of the wheat from Northern Russia to be distributed among the Indian agencies, to be grown on their reserves, a portion also was kept to be sown on the Experimental Farm at Ottawa.

A copy of the following circular was sent with each sample of the Russian wheat:

"CENTRAL EXPERIMENTAL FARM,

"DEPARTMENT OF AGRICULTURE,

"Ottawa, 1887.

"DEAR SIR,—There has been sent to you this day by mail from the Central Experimental Farm, a sample bag of Spring wheat, which has been obtained under instruction of the Minister of Agriculture, from one of the Northern Provinces of Russia. This wheat has been ripened above latitude 56, more than 600 miles further north than the City of Ottawa, where the summer

season is very short; hence it is expected that it will ripen in Canada earlier than any of the varieties now in cultivation.

"You will oblige by testing this wheat and returning at the close of the season to the Central Experimental Farm, Department of Agriculture, Ottawa, by mail, in the bag herewith sent, a sample of the same as grown on your land, also state the character of the soil on which it was grown, the date of sowing, the time of ripening and the yield, with any other remarks relating to it which you may believe to be of importance. Tested at the seed house at the Experimental Farm, both in the soil and in the seed tester, this grain has produced a vigorous growth, 98 per cent. germinating promptly.

"WM. SAUNDERS,

"*Director.*"

Only part of the returns have as yet been received, but as far as they have come in, they show a most gratifying success, establishing the fact that this wheat will ripen in Manitoba and the North-West from ten to fifteen days earlier than Red Fife, a gain which past experience would lead us to believe would be sufficient to secure this most important crop from all danger of frost. The shipment from Russia was not received until the seeding season in the North-West was nearly over, hence the wheat could not be sown early enough to give it a favourable chance; on this account it will require the experience of another year to establish with accuracy its period of ripening. This subject is of such vast importance to the future of the country that no pains will be spared in the endeavour to ascertain the true bearing of all the facts. Samples of this wheat as grown in the several Provinces are being submitted to eminent experts for their opinion as to its quality, it is also undergoing careful chemical analysis with other wheats for comparison, and if practicable a portion will be ground into flour and its value in bread making tested; a special bulletin on the subject will be issued as soon as all the desired information is available.

In the meantime the interest awakened in the subject in the North-West is very great, and so large a number of applications have been sent in for samples for spring planting, that a second consignment has been ordered from Riga, which supplemented by what has been grown here will, it is hoped, be sufficient to introduce this wheat into almost every locality and prepare the way for its general cultivation within two or three years.

The Manitoba wheat distributed consisted of Red Fife, White Fife and White Russian, all good samples. These were sent mainly to farmers in Ontario and Quebec, with the view of ascertaining whether seed wheat obtained from the north would manifest unusual vigour and fertility. The season in these Provinces has been so unfavourable that no very reliable data is likely to be obtained this year.

SPRING WORK.

On the second of May the ground was sufficiently free from frost to permit of work being begun on the Central Experimental Farm. The removal of internal fences, the gathering up of stone and the removal of stumps, necessarily delayed and limited other operations.

Ploughing was begun on the 2nd and seeding on the 6th of May. Many acres were brought under cultivation and seeding and planting were continued until the season was quite advanced.

GRAIN TESTING.

Sixty-seven varieties of spring wheat were sown, a large proportion of which were obtained from Europe, some from Russia, France, England, Hungary, Greece, Italy and Germany, also several from India, New Zealand, Australia, Japan, and others from the United States. Many samples were kindly donated by Prof. Lazenby of the Ohio Experiment Station at Columbus, and some by Prof. Brown of the Ontario College of Agriculture, Guelph. Owing to the great drought which prevailed this year during the growing period, the results have not been entirely satisfactory and another year's testing will be needed before the relative value of these varieties can be determined. Among the promising sorts the following deserve special mention: Pringle's Champlain, Improved Summer Cob, White Delhi, Californian White, Trimenia Sicilian Bearded, Galician Summer, Indian Hard Calcutta, Hungarian Mountain, Russian Hard Tag, Bearded Summer and Bearded March.

Thirty-one varieties of Barley have also been grown, among which the following are of much promise: Scholey's Chevalier, Hallet's Pedigree Chevalier, Swedish, English Malting, Danish, Californian, Screened French, Bestehorn's and Golden Melon. The Six-rowed Mandschurian and Large Two-rowed Naked are among the heaviest yielders

Of oats sixty varieties have been tested, the most promising of which of the white sorts are: Scotch Angus, Tartarian White,

August White, Swedish, Egyptian, Waterloo, Australian, Hungarian White, Scotch Berwick and Georgia Early White, and among the black varieties Longfellow, Hallets's Pedigree Black Tartarian.

A large proportion of these varieties of grain were obtained in small quantities, and grown in plots of 20 by 40 feet; about thirty sorts were grown in one-fifth acre plots and the remainder in larger quantities.

POTATOES.

Two hundred and forty-five varieties of potatoes were also obtained, chiefly from Europe, but most of them in small quantities only. The most promising productive sorts among the newer introductions are August Kidney, White Star, Emperor William, Queen of Potatoes, Manhattan, Jackson's Improved, Niagara, Ganea, Paterson's Napoleon, Crimson Garnet, King's White Kidney, Erfurt Incomparable, Sugar and Giant. A very promising seedling originated by Mr. Thos. A. Sharpe, of Wakopa, Manitoba, was also tested, and proved to be an excellent cropper. As the yield from the small quantities of seed obtained was necessarily limited, it has been thought best to save the whole crop for seed and leave the question of quality for consideration next year, when the varieties composing this large collection can be more fully reported on.

OTHER FIELD CROPS.

That portion of the farm which had been seeded down to timothy and clover yielded a very good crop of hay, amounting in all to over 145 tons. Of the standard varieties of potatoes such as Early Rose, Beauty of Hebron and Chicago Market, very fair crops were obtained; the same may be said of the carrots, mangolds and turnips grown for stock. Several acres of peas of the variety known as the Golden Vine also yielded well.

None of the land could be got into fit condition for experiments with grasses or with fertilizers until it was too late in the season to undertake such work. It is proposed to carry on experiments in this direction during 1888.

HORTICULTURE.

Since the climate of Ottawa is very fairly representative of the larger part of Quebec and Ontario, it is of much importance that the fruit-growing capabilities of the district be ascertained as early and as fully as possible. With this end in view an extensive collection

of both large and small fruits has been brought together, special attention having been paid to those varieties which are likely to be very hardy, including all those of Russian origin which could be obtained, as the climate on account of its severity here, has hitherto been regarded as unfavourable for the growth of most kinds of fruits.

LARGE FRUITS.

The collection comprises 903 apple trees of 297 varieties, of which 174 are Russian sorts; 298 pear trees of 101 varieties, 45 of which are Russian; 197 plum trees of 72 varieties, 32 of which are Russian; 155 cherry trees of 71 varieties, 54 of which are from Russia and other parts of Northern Europe; 25 Peach trees of 11 varieties, American; 7 Apricots of 4 varieties, 2 Chinese and 2 European; and 26 crab apple trees of 12 varieties, chiefly American.

SMALL FRUITS.

The collection of small fruits includes 891 hardy grape vines of 127 varieties, 865 currant bushes, comprising 20 varieties of the standard named sorts, to which must be added nearly 100 new seedlings, some of which are very promising. In the collection of 251 gooseberries there are 30 named sorts and about 50 unnamed seedlings. The 3,650 raspberries are represented by 38 named varieties and about 200 unnamed seedlings, among them are many interesting hybrids, some of which, from this season's showing, give promise of great fertility. Among the 509 blackberry plants there are 20 named varieties, including all the hardier sorts obtainable, and in the strawberry beds there are 20,900 plants of 90 named sorts and about 50 unnamed seedlings, forming a collection of much interest and promise.

FORESTRY.

Eighty-eight thousand young forest trees and ornamental shrubs have been procured and planted, comprising both evergreen and deciduous sorts, including many native and foreign species. The total number of species and varieties exceeds 500, among which are many never before introduced into Canada; this collection will be largely augmented by the product of the seed beds. It is intended that such sorts as prove hardy shall be propagated for testing in other parts of the Dominion.

SEED DEPARTMENT.

The seed beds consist of 278 frames, twelve feet long and four feet wide, in which there has been sown a large collection of the seeds

of trees, shrubs and plants. 335 packages were kindly sent from the Royal Gardens at Kew, London, England, a donation from the Director, W. J. Thistleton Dyer, Esq. This collection consisted almost entirely of ornamental shrubs and forest trees, many of them rare and valuable, from which it is expected that a large quantity of choice material will be obtained for future planting. Similar liberality has been shown by the Director of the Imperial Botanic Garden of St. Petersburg, Russia, Dr. E. Regel, who has sent 300 packages, about 100 of which were sent direct, the remainder to Mr. Chas. Gibb, of Abbotsford, Quebec, who very generously gave them to the Experimental Farm. In this assortment there were a large proportion of herbaceous and succulent plants from the Northern regions of Europe with seeds of a number of species of shrubs and trees from Turkestan and Siberia. Through the kindness of Prof. C. Sassaki, Director of the Botanic Garden of the Imperial College of Agriculture at Tokio, Japan, 110 sorts have been obtained from that interesting country. In the Japanese collection there were forty species of trees and shrubs from the most Northern Provinces of the Empire, where the temperature is severe and the snow fall heavy during the winter months. It is probable that some of these will prove hardy in this country. Besides these about 1,200 sorts have been secured by purchase in Europe and America. Seeds from native Canadian forest trees and shrubs have also been planted in considerable quantities, gathered in Ontario and Quebec, while smaller collections have been obtained from the North-West Territories, British Columbia and other parts of the Dominion. A fair proportion of the seeds planted have started and made good growth, but as there are many sorts which remain over a year in the soil before germinating, most of the seed beds will be left undisturbed until the close of another season.